

frequently mistaken by anatomists for the whole of the notochord, in the intervertebral regions of the column. It is present in *Chimara*, *Acipenser*, *Petromyzon*, *Myxine*, and traces of it are present in higher types. It may be derived from the primitive central canal of the notochord, or mark the point from whence that canal has disappeared. The partially tubular notochord of Hemichorda would countenance this view as well as the partially hollow notochord (at the caudal region) of the embryos of some birds.

The writer would here acknowledge the value and importance to him of materials kindly supplied to him from the National Museum at the instance of the obliging Director of that institution, Dr. G. Brown Goode.

On the Genus Nyctinomus and Description of Two New Species.

By Harrison Allen.

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The genus *Nyctinomus* includes twenty-one species and is of cosmopolitan distribution. Thus ten species are found in Africa and Madagascar; one in Europe with a range in the northern part of Africa; two in India; two in the Malay Archipelago; one each in Polynesia and Australia, and four in America. It is interesting to contrast this wide range with that of the other two genera of the group in which *Nyctinomus* is found, namely *Cheiromeles*, which is restricted to the Indo-Malayan subregion, and *Molossus*, which is confined to tropical and subtropical America, excluding the United States. Notwithstanding the extended range of *Nyctinomus*, the species are closely related. With the exception of *N. johonensis* and *N. australis*, few specialized structures are met with; and but two species—one from Madagascar (*N. albiventer*) and a second from Africa (*N. acetabulosus*)—depart from a single formula for the teeth. As is the case with the *Cheiroptera* generally, the American species are the most obscure. Of the four described species, I have seen *N. brasiliensis*, *N. macrotis* and *N. gracilis*. A recent study of the materials at hand has led me to record descriptions of two new species.

NYCTINOMUS EUROPS, n. s.

Muzzle divided in middle into two parts by a vertical linear groove, the sides of which are defined by spines. These are continuous with the spines of the upper border of the muzzle. Ears united over the face for a

distance of 2 mm. The outer border of the auricle not scalloped on the line of the external basal ridge, but is uniformly rounded. The revolute margin reaches as far as the anterior border of this ridge. The inner border of the auricle retains six small marginal spines. The tragus is small pointed, or obscurely notched on the summit, and is but $\frac{1}{2}$ mm. high. The antitragus, as wide as high, much narrower above than at base; the notch posterior to it is well defined and reaches half way to the base. The external basal ridge is rudimental. The keel is not highly developed and measures 7 mm. in length. The first and fifth toes are thicker than in *N. brasiliensis*.

The tip of the third phalanx of the fourth finger is without projecting lobe.

The lips and adjacent surfaces are more tumid than in *N. brasiliensis*. The postmental wart is especially conspicuous as compared to the same structure in that species. As in *N. brasiliensis*, a medium ridge lies between the wart and the lower lip.

Measurements of Head and Ears.

	mm.
Distance from interauricular membrane to end of muzzle	3
Height of auricle	1.3
Distance of auricle to angle of mouth.....	2
Width and height of antitragus.....	3

In the entopatagium* the intercosto-humeral nerve divides into two terminal branches at the upper third of the wing membrane before reaching the elbow.

Four oblique lines in the positions of the intercostal nerves can be discerned.

The mesopatagium with the internal cutaneous nerves much the same as in *N. brasiliensis*; but the superior branches are much less numerous than in that species. The distal end of the second phalanx of the fifth finger is spatulate.

The nerves on the interspaces the same as in *N. brasiliensis*. First oblique band at radio-carpal angle attached at side of palmar surface of the muscle-mass of the fifth metacarpal bone and passes downward and inward at an angle to the radius for a distance of 4 mm. The pouch is conspicuous.

The tendon of the palmar interosseous muscle extends from the middle of the fifth metacarpal bone to the distal end of the first phalanx.

Fur on the back of a delicate fawn inclining to brown at the shoulders.

* For explanation of the terms endopatagium, and mesopatagium, see Proc. Acad. of Nat. Sci., Philadelphia, 1889, p. 314.

The back of the neck and head of a lighter shade. Back of the ear the hair is almost white and covers the posterior surface to a point just beyond the line answering to the keel. The fur of the venter is of a uniform light brown hue, verging to white. The wing membranes and tail membrane are of a brown color and are naked, excepting along a line continuous on the dorsum from the shoulder to the middle of the thigh. A delicate line of fur extends from the upper third of the arm to the middle of the thigh. The fur of the trunk both at the shoulder and thigh is continuous with this line, but on the entopatagium the hair is absent alongside of the body.

On the venter the foot and the distal third of the tibia are the only parts seen of the lower extremity, the remaining parts are concealed by a fold of skin which extends from the pubis to the lower third of the tibia.

The tail membrane with distinct pelvo-tibial line, but without the line from knee which is seen in *N. brasiliensis*. The free margin of the membrane without the lobe which is so well seen in the species last named.

The Cranium.—The superior angle of the occiput is more acute than in *N. brasiliensis* and smaller by one-half. The temporal crest is distinct throughout its entire length. In *N. brasiliensis* it is absent except at the anterior half. The dorsum of the face is without the groove so characteristic of *N. brasiliensis*. The anterior nasal aperture is ovate, not cordate, as in the species last named. The lachrymal process is conspicuous and trenchant. The zygomata are of uniform width. The mentum is recedent; the posterior border being on a line which extends between the second premolar and the first molar. The coronoid process is scarcely higher than condyloid; the angular process projects well back of the condyloid.

Measurements.	<i>N. europ.</i>	<i>N. brasiliensis.</i>
	mm.	mm.
Length.....	16	17
Width between zygomata posteriorly.....	9	10
Width of cranium at narrowest part.....	3	4
Distance from anterior edge second premolar to end of face.....	2½	1½

The Teeth.—

Inc. $\frac{1-1}{2-2}$, c. $\frac{1-1}{1-1}$, pm. $\frac{2-2}{2-2}$, m. $\frac{3-3}{3-3}$.

Upper incisors near together their entire length. Interval between them much less than in *N. brasiliensis*. First premolar lies to outer side of the postero-basal cingule of the canine, which almost touches the second premolar. In *N. brasiliensis* the first premolar is in line with the cingule. This distinction is associated with a shortening of the axis of the face from the centre of the incisorial space to the first premolar.

Lower incisors equal, bilobed, not crowded.

Measurements of Body.

	mm.	
Length of head and body	53	
“ “ tail in membrane	17	
“ “ “ free	19	
“ “ forearm	40	
“ “ first finger, including metacarpal	8	
“ “ second metacarpal	3.9	mm. mm.
“ “ third “	40 ;	1st ph., 19 ; 2d ph., 15
“ “ fourth “	40 ;	“ 15 ; “ 3
“ “ fifth “	23 ;	“ 13 ; “ 3
“ “ tibia	11	
“ “ foot	7	

The description is based upon examination of twenty adult specimens, all females.

Habitat, Brazil. Collected by Prof. Harte. Prof. B. G. Wilder has kindly permitted me to study the Cheiroptera in the museum of Cornell University. The species above named was secured from this collection, where the type specimens remain.

N. europs resembles *N. megalotis** in the shape of ears and color of fur. It differs in the shape of the antitragus. *N. megalotis* is a larger form, the length of the body and head being 75 mm. (3''), and that of the forearm 56 mm. (2.35''), yet the length of the second phalanx of the fourth finger is less than 1 mm. (0''.1). This phalanx in *N. europs* measures 3 mm.

NYCTINOMUS ORTHOTIS, n. s.

The upper margin of the muzzle is below the plane of the dorsum of the face. The vertical ridge between the nostrils seen in *N. europs* and *N. brasiliensis* is absent. The nostrils are elliptical, slightly expanded above and look directly forward. The entire region of the muzzle abruptly cut off, and of quite peculiar physiognomy. There is no concavity in front of the ears. The upper border of the muzzle is not projecting, and without pectinate spines, but furnished with papillæ, which extend over the nostrils. The ears are erect, large, extending 4 mm. in advance of the muzzle, and are united on the dorsum of the face by a band 3 mm. high.

The general form of each ear is rounded and stands out from the head as in *N. brasiliensis*. No spines occur on the upper border. The outer border is furnished with a lap or hem of skin, which measures one-fifth of the diameter of the ear couch. It is slightly scalloped in the middle and extends as far forward as the end of the external basal ridge. The keel does not reach the antitragus ; it is thickened and not revolute. The anterior basal ridge forms a distinct projection at the notch. The notch

* Dobson, Cat. Cheiropt., Br. Mus., 1878, p. 434.

extends to the base of the antitragus. The antitragus is thin, broader than high and slightly higher posteriorly than anteriorly. A skin fold extends from the antitragus to the angle of the mouth. The tragus is quadrate and bears a general resemblance to that in *N. brasiliensis*. The sides of the face are without folds.

The fur on the dorsum is fawn color with paler tints at the base. It extends half way up the ears. On the dorsum the proximal half of the arm, the endopatagium near the body, and the basal fourth of the tail are covered with hair. On the venter the color is the same as on the back, except on the face and ears, where it is of a dark chestnut. The venter, the arm, the thigh and entopagium half way to the elbow are covered with a thin layer of fur. The face is occupied by a number of stout bristles between the ears and the muzzle. Two hairs, 1 mm. long, project from the mental wart.

The following notes have been made on the terminal digits. That of the third digit of the third finger is little over 5 mm. in length, is slightly curved toward the trunk at the tip. A thin membrane is seen at the distal half at the thumb side. The wing membrane extends to the tip toward the trunk.

The terminal digit of the fourth finger is 3 mm. long. The membrane is not attached to the somad surface; while on the pollicad surface it is attached the entire length of the digit. The phalanx is markedly deflected on the free margin of the membrane and ends in a free lobe.

The terminal phalanx of the fifth finger is slightly curved somad. It is 3 mm. long, and nearly 1 mm. wide at base. The membrane is attached to the second phalanx at the middle of the pollicad margin, but reaches to the tip of the phalanx on the somad side.

No entopatagial lines are seen. The internal cutaneous line exhibits a superior branch. The nerve ends abruptly by inferior vertical branches as in *N. brasiliensis*. A line is seen on the interfemoral membrane extending from the middle of the thigh to the free margin of the membrane.

Cranium.—The cranium is of the type of *N. macrotis*. The facial region is high, the nasal bones at the anterior nasal aperture being the highest point of the vertex. The upper border of the aperture is defined by a transverse line, which forms a right angle with the lateral border. A line drawn downward from the border intersects the infraorbital foramen at its posterior limit. The zygoma is without elevation. The ethmoidal swelling (by which term is meant the swelling, in the orbito-temporal fossa, of the frontal bone over the ethmoid) is rounded. The palatal rugæ opposite the molars abruptly angulated, the angle being forwards.

In contrast to the above, the skull of *N. macrotis* presents the following: The facial region at the anterior nasal aperture is the lowest part of the vertex. The upper border of the aperture is Δ -shaped. A line produced downward lies in front of the infraorbital foramen. The zygoma with posterior elevation. The ethmoidal swelling is ridge-like.

The palatal rugæ opposite molars not angulated, but slightly curved, the curve being forwards.

Dental formula the same as in the preceding species.

The first maxillary premolar in *N. orthotis* is in the outer angle between the second premolar and the canine. It is smaller than in *N. macrotis*. The postero-internal cusp of the first and second maxillary molars continuous with a single crescentic cingulum. The cingulum of the third molar of the same series of a single crescentic form. Mandibular incisors four. The first mandibular premolar touches canine.

In *N. macrotis*, the first maxillary premolar is in dental arch, *i. e.*, is neither in outer or inner angle formed by the crowding of the canine tooth and the first premolar, but is in the axis of the dental series. The postero-internal cusp of the first and second maxillary molars separate from the double crescent form of the cingulum. The cingulum of the third molar of the same series of a double crescentic form.

Measurements.

	mm.	
Length of head and body.....	68	
Height of ear.....	20	
Length of forearm.....	57	
“ “ thumb.....	5	
“ “ 2d metacarpal bone....	22	mm. mm.
“ “ 3d “ “ ...	25 ;	1st ph., 10 ; 2d ph., 9
“ “ 4th “ “ ...	24 ;	“ 10 ; “ 4
“ “ 5th “ “ ...	12 ;	“ 9 ; “ 3
“ “ tibia.....	20	
“ “ foot.....	7	
“ “ tail in membrane.....	25	
“ “ tail free.....	9	

Habitat, Jamaica. The single specimen is a skin in the collection of the National Museum (No. 9397, W. T. March), and was received from Spanishtown.

I have been minute in the description of these new forms for the reason that diagnoses of species have hitherto been too general. Some of the characters, such as the shapes of the terminal phalanges, the patterns of the wing membranes, the depth of the notch in the auricle and the point of termination of the auricular flange or hem have not been used in studying Cheiroptera. Even if the attempt to establish new characters should fail, it is of interest to record these novel details of structure.